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## Post-Election '96: Q&A With NSF Director Neal Lane

*Neal Lane, Director of the National Science Foundation, spoke to SGR Editor Greenberg on November 7. Following is the text, transcribed and edited by SGR.*

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***SGR.*** *What do you see for NSF as a result of the election?*

***Lane.*** I expect a better year than we have just been through.

***SGR.*** *That the budget for Fiscal '98 will be better?*

***Lane.*** I expect the whole process to work better. I think the Congress will be a little smoother. I know that the President continues to care about science and technology.

***SGR.*** *A lot of people would dispute that. He hasn't put his shoulder to the wheel.*

***Lane.*** What I'm hearing him say is that we're underinvested in research, that he wants to do everything that he can to increase that investment. I think he used the word "dramatically" on one occasion. I take that as very encouraging.

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Speaker Gingrich has been an advocate for science for a long time, and I hear the Speaker talking about finding common ground with the President and moving the country forward. The political environment seems to me a rather positive one for science.

***SGR.*** *Where will they find the money?*

***Lane.*** Money is the only problem here. If you're going to balance the budget, you've got to find the money. I am concerned about these budget problems, because I believe that we must substantially increase the investment in science, technology and education. And we can't wait three or four or five years to do that, when we'll be well behind the curve.

***SGR.*** *Nonetheless, if you look at the budgets over a span of recent years, things haven't been too bad. NSF has gone up a real three or four percent. NIH has risen even more.*

***Lane.*** It has been better than any of us expected, but if you look at the projections out to 2002, they don't look very good.

***SGR.*** *Whatever the projections, the American political system still runs on a year-to-year basis.*

***Lane.*** Every year is a new year to make the very best case we can for a strong budget for science and for NSF in particular. That's what we intend to do every year from here on out. But if the country is going to balance the budget by the year 2002, you're going to find the money some place, and right now it's squeezing the discretionary domestic part of the

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## *R&D Budget Crunch Is Bound to Tighten Next Year*

The general assessment in Washington science-policy circles is that the election results will have little impact on the budgets and heartfelt issues of the research community.

But don't count on it, or expect a continuation of the ax-dodging feats that brought the research agencies through the past two years with minimal damage. The federal budget is now poised for a continuing downward glide, with no hands on the controls, and research and many other federal activities are going to pay the cost.

True, the cast of legislators centrally concerned with science, technology and related matters will be little changed when Congress convenes next year. Most of the key chairmen who presided over S&T in the last Congress will be

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## In Brief

**It's not true, says the spokeswoman for NIH, concerning rumors that Director Harold Varmus will soon leave for the Presidency of Rockefeller University. Varmus, about to begin his fourth year at NIH, is staying put, she says.**

***As for John Gibbons, the President's Science and Technology chief, the* Washington Post *said last week that he's not likely to stay on. Gibbons, whose main residence is in rural Virginia, responds to the inevitable question by noting that he recently renewed the lease on his downtown Washington apartment.***

**After decades of running the House and Senate as they liked, the surviving Congressional Democrats glumly went into minority status following the 1994 election. The 1996 election keeps them there, with only skeleton staffs allowed by the dominant Republicans. And since the party controlling the White House usually loses seats in the mid-term election, the Dems are contemplating four more years of minority. For Rep. George Brown (D-Calif.), the elder statesman of science on Capitol Hill and long a big buddy of the science establishment, the election means another stretch on the sidelines. Brown, 76, was reelected by 1150 votes.**

***Small and late, a science contingent was out there waving the banner for Clinton's reelection, with an announcement—one week before Election Day—of Scientists and Engineers for Clinton/Gore, consisting of "More than 500 scientists and engineers—including 12 Nobel laureates—from 41 states and the District of Columbia." Among the co-chairs: former Astronaut Sally Ride, Nobelists J. Michael Bishop and Leon Lederman, and Anne Petersen, former Deputy Director of NSF.***

# . . . President and GOP Stick to Budget-Cutting Vows

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back, and the few who won't are likely to be replaced by ideological kinsmen.

One of the most prominent retirees from research affairs, Chairman Robert Walker (R-Pa.) of the House Science Committee, is almost surely to be succeeded by Rep. James Sensenbrenner Jr. (R-Wisc.), who was rated the Congress's number one budget cutter by the National Taxpayers Union in 1994.

Defeated for reelection, Senator Larry Pressler (R-SD) will be succeeded by Senator John McCain (R-Ariz.) as Chairman of the Commerce, Science, and Transportation Committee. But the Committee, despite its title, never got deep into research policy under Pressler and there's nothing in McCain's track record to suggest a change of course in that respect. Defense policy and foreign affairs have preoccupied McCain for many years.

Senator Ted Stevens (R-Alaska) ascends to the Chairmanship of the Senate Appropriations Committee, succeeding the retired Mark Hatfield (R-Oregon), the ever-reliable patron of the National Institutes of Health. Senator Arlen Specter (R-Pa.) remains Chairman of the NIH Appropriations Subcommittee. The House, however, has provided the impetus for NIH's budgetary exemption from the Republican Revolution, and the key spots remain unchanged in that chamber. The impresario of NIH growth, Rep. John Porter (R-Ill.), has pulled off budget miracles for two years in a row as Chairman of the NIH Appropriations Subcommittee. The financial feats are so contrary to expectations on Capitol Hill that wonder abounds as to whether Porter can score again in the next Congress.

During the campaign, the President uttered rare sweet words about science and technology, raising hopes of strong backing, such as those expressed in the Q & A in this SGR by Neal Lane, Director of the National Science Foundation. Moreover, it looks as though Clinton will keep in place a cadre of long-serving research-agency chiefs who are bubbling with big plans, if only they can get the money. There are many rumors and speculations, though so far no official word of departures from the major research posts.

But fiscal and political reality are teaming up in a way that virtually assures harder times to come—not just the slow growth and budget shaving of recent times. In the first four years, Clinton expended little personal time or political capital on research-related affairs—small stuff for any Presidency, but especially so for this one. There's no reason to expect a turnabout in his second time around. What's more likely is that the President will be increasingly hemmed in by deficit-cutting imperatives while a horde of nasty Congressional investigations saps the Administration's time and spirits.

Immediately after the election, Clinton strongly renewed his campaign vows of a balanced budget and, once again astonishing many of his loyal troops, even changed course to back a constitutional amendment for a balanced budget—before flip-flopping the next day. Even so, his tough budget talk takes another issue away from Congressional Republicans, who are ready to pounce if Clinton reneges on his many ironclad assurances of frugality.

Not much should be expected from the post-election public congeniality between the White House and Congress. A blood feud seethes behind the interparty pledges of cooperation in the national interest. At least 10 separate committees in the new Congress are gunning for the White House on campaign finance and other ethics issues. "I think there are big troubles ahead for this President," Trent Lott, the Republican Senate Majority Leader, said last week. Indictment of Hillary Clinton for alleged mistruths in the Whitewater investigations is often predicted. The fiscal plight of the ever-complaining, and seemingly prosperous, American science establishment did not rate a high priority in Clinton's first Administration, nor will it in the second.

The Republican design for balancing the budget by the year 2002 calls for huge reductions—20-30 percent, depending on who's counting—in the discretionary sector that finances science and technology. The Clinton plan, though never spelled out in detail, appears to be less severe and is keyed, the President claims, to protecting "investments" in education and technology, and presumably science, though the word is not often mentioned by the President in that context. Nonetheless, Clinton's long-term budget design calls for reductions in the discretionary accounts.

The stage is thus set for a further tightening of federal expenditures and an intensification of fighting over shares by Washington's various dependencies. Science, particularly university-based research, is as dependent as any of them, but, politically, it's a no-show on the Washington scene.

Politicians value money and voluntary labor at election time, neither of which has been forthcoming from the scientific community, except in trivial amounts. Out of election season, the pols revere adulation. Science has been pretty good at that, bestowing medals and plaques on some of its legislative friends. But that's not enough.

The research community should brace for a rough ride.—DSG

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# . . . Small Firms Increasing Links to Academic Science

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budget, and, gee, that's a small piece of the pie.

***SGR.*** *Science can appeal to goodwill and understanding, but it can't rally the troops at election time like the veterans or housing interests do.*

***Lane.*** The good news is that science has always enjoyed strong bipartisan support. This agency has. The public, every time they're asked, feels very positive about science. I think we simply have to do a better job in helping the public understand how not only is science a good thing but that science and technology are critical to the future of the country and to the quality of jobs for their children and their grandchildren. That probably hasn't fully come across.

***SGR.*** *What is the basis of the assumption that if the public knew more about science it would be more politically supportive?*

***Lane.*** It's a debatable point. We have the goodwill of the public right now. But then you start asking, do they really understand? Depending on how you ask the question, you get in the 10-20 percent range. So, we've got good will, and yet the public says they don't understand science. I don't know what the public would do if twice or three times as many really had a deeper understanding of science. But it's our responsibility to try to ensure that they do, because their future depends so strongly on it.

***SGR.*** *But if additional resources can't be squeezed out of a shrinking discretionary budget, the future is bleak.*

***Lane.*** It's hard to fault the logic there. We could turn to industry. I find the leaders from industry concerned about the possibility that the federal government might reduce its investment in science and engineering. Because industry understands that without those advances, they're not going to find the technologies and the knowledge they need down the road.

***SGR.*** *For all the talk about industry helping research in universities, the amount of money remains fairly small and concentrated in a few institutions.*

***Lane.*** But it has been one of the more rapidly growing pieces, even though the base was small. I believe what we're going to see increasingly is much broader interaction, especially with small business. Small businesses in a city, region, state, interacting with nearby campuses in ways that we wouldn't have seen a decade ago. We're seeing some of that now, and I expect that to continue. But I don't see how that can in any short period of time replace the kinds of cuts we're talking about in the federal investment in R&D.

***SGR.*** *Small business linking up with university research?*

***Lane.*** I've found that sometimes small business is interested in actually having one of its people in the university laboratory fulltime because they can't afford anything like research infrastructure. It does depend on the kind of small business. A small biotechnology firm would have a very different need for access to research than some other kind of company.

***SGR.*** *You squired a group of Nobel laureates around Washington a few weeks ago, and they were very gloomy about the future of science.*

***Lane.*** They did express some deeply rooted concerns that probably reflected the views of the science community.

***SGR.*** *Is the science community that deep in the dumps emotionally?*

***Lane.*** That is what I hear. I get around, and what I hear is that the science community appreciates that something has changed. They're no longer questioning whether the environment is different from what it was when they were growing up. And they're very worried about it, because they feel that science is a wonderful profession and is very important to the country.

***SGR.*** *The country has been through economic turmoil and a great political turnabout.*

***Lane.*** Right, but the turning point was probably the terrible budget battles of the last year and the shutdown [of government agencies, including NSF]. That was a real wake-up call to the whole community. But I want to emphasize how good I feel about where NSF is right now, having come through a period of great uncertainty and political difficulty.

***SGR.*** *"Uncertainty and political difficulty"—are you referring to the new Republican Congress two years ago and the priorities it tried to introduce?*

***Lane.*** Yeah, I guess the period of the last couple of years and the large shifts in priorities and people in the Congress.

***SGR.*** *Chairman Walker [of the House Science Committee] said they were trying to put resources into basic research by taking money away from industrial research programs. It would seem that would benefit NSF.*

***Lane.*** I think it's a mistake to try to draw too clean a line between basic and applied science. That's just not the way it's done anymore. So long as you provide the freedom to good people, the best people, to explore nature and the built environment, as engineers do, and enable them to have the infrastructure they need to do the experiments, make the calculations, access the people and the places to do the research, good things are going to come out of that. The discussion got a bit confused in the last couple of years about sharp distinctions between science and technology.

***SGR.*** *In Britain, they're concentrating their limited research money for each of the various disciplines in a handful of university departments that are intended to be excellent. Is that unthinkable in the American context?*

***Lane.*** It's not a good idea in America. What we find in this country is that superbright people are born everywhere. And they get their education everywhere. If we don't insure that the institutions, universities and colleges are high quality all across the country, the nation as a whole will suffer.

***SGR.*** *Are there specific fields of research or disciplines that you find seriously under-supported?*

***Lane.*** Given the capacity that we have, we could make

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# . . . Capacity Underutilized in All Fields of Research

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substantial increases in essentially every field that NSF supports and get more returns on that investment. There is underutilized capacity there. In some sense, we're wasting our resources by not making that investment. There are some areas that NSF identified that we think require special attention. One of them that we're talking about a good bit now is a broad area—we call it knowledge and distributed intelligence. It's a way to take advantage of the advances that have been made in networking, in supercomputing, in learning and artificial systems, and interact all of them. The goal is to move us from the data mentality, even though the data are very accurate and very important, toward more user-friendly information, and then finally to knowledge and intelligence. And "distributed intelligence" really means wrapping the network around all of that. It means a more friendly network, more efficient, better organized, so that this intelligence, which is really just the capacity to understand, the capacity to learn, is everywhere, it's accessible to everyone who needs it, without delay.

***SGR.*** *What are you doing in that area now?*

***Lane.*** We're doing a lot. The new supercomputer center program that we call PACI, the Partnership for Advanced Computing Infrastructure, is a part of that. The place where that is pushing forward is in capability of the computer itself to do more—faster calculations, handling of bigger data bases, handling of more complex problems, new algorithms, software and so on. We've got a good record on that and we're now going to the next stage of research, which aims for broadband, faster networks, more powerful networks. We're trying to understand how to handle massive data bases where pieces of them are all over the country. You want the whole thing to work as a system, but we don't know how to do that. It's not just a matter of cost. We just don't know the answers to the basic research problems.

These are ripe problems. What we're trying to do, though, that is different from the past, is to get people who have been focused in different areas more in touch with one another. They'll be in a position to recognize common needs and exchange information so that we can actually get to what's called distributed intelligence. Another piece of that, which is a pilot program for us, is not so large right now. It's called Learning and Intelligence Systems. That's to take advantage of the advances that have been made in the theory of learning and what psychologists know, cognitive scientists, biologists, about human learning, animal learning. And then get those people in touch with the computer scientists, computer engineers, mathematicians who study systems learning and system adaptation. The scientists themselves say it's time to bring these people together.

***SGR.*** *The engineers periodically complain that they're not getting a proper share of NSF's budget. It's probably about 10 percent. With this Administration stressing the importance of technology, why that small share?*

***Lane.*** These distributions are historically derived. We are where we are through years of investment, and the community develops according to the amount of research support, on the one hand, and the needs of the universities for courses and degrees and so on, on the other hand. There are lots more faculty in universities in, say, the math and physical sciences and the geo-sciences than there are in engineering. The enrollments are much larger also. So, there are some scale factors there that are significant. But then you could ask the question, "Yes, but why, even under a historically derived budget, why is engineering that amount?" I think that one reason is a lot of funding for engineering comes through the mission agencies. It's true that much money for science has as well, but in engineering, three-quarters of the support of academic research in certain fields comes from other agencies, in some cases from the Department of Defense. But it includes NASA and DOE, as well. It's an important point for us to be clear on. NSF has a unique mission, and a broad one, to promote progress in science and engineering, but it's just one agency in the larger federal system, and a small fraction of the total amount of money invested in research, including academic research. So, we have to look at all of that when we're thinking about the health of science and engineering in universities and colleges.

***SGR.*** *With the Cold War gone as a rationale for support of science, some people say we have to find a new rationale.*

***Lane.*** It's a little more complicated than that. The rationale of fear of the evil empire that might come and take away our lives and our freedoms—that's pretty scary. So, as a single rationale, that's pretty powerful and was influential in public attitudes. Now, it's a new kind of fear, and it is more complex. Now, I think we should, if not be afraid, at least be concerned about our lives and our freedoms in the next century. And that's a much larger set of issues to look at.

It's not that it's a new rationale for science, engineering and technology. But we somehow didn't take care to articulate it as carefully as we might have during the Cold War. While we were investing in science and engineering, we saw the returns that were being made to the economy and other social gains. We saw the educational benefits that came out of those investments. But we weren't making it clear to the American people how important that investment was and how dangerous it is to start cutting it back. And that's why I've had this discussion with the science community, where we coined the term "civic scientist"—we didn't coin it, but at least we used it—and said, look, we as scientists and engineers are going to have to do a much better job of getting out with the public and explaining how their tax dollars are used and why it's so important that we continue, perhaps even increase, our investment.

***SGR.*** *What do you mean by civic scientist?*

***Lane.*** I mean that not only is it my obligation as a scientist to do world-class research and outstanding teaching, but that

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# Non-Profit Pay Checks

## *The American Medical Association*

The American Medical Association is no longer the behemoth of the profession that it was in the 1950s, when some 90 percent of all physicians in the US held membership, and the AMA was the major power in health-care politics. With the proliferation of specialty societies, AMA membership has fallen to about 40 percent of the physician workforce. And its political prowess has declined as the federal government, insurers, managed care and giant health-care corporations have crowded into the field.

Nonetheless, the AMA is by far the largest and richest of the physician organizations, with a membership holding steady at about 296,000 in recent years, and revenues of $163,340,465 in calendar 1994, the year of the AMA's latest tax filing. A regular membership, currently $420 per year, is accompanied by a subscription to JAMA, the flagship journal among 10 other publications of the AMA.

But even with those big numbers, the AMA had to call on reserves to cover a 1994 deficit of $12,207,950, following a 1993 deficit of $23,633,178. Senior salary levels, however, have remained at the upper scale of the non-profit leagues.

The AMA holds tax-exempt, non-profit status under section 501(c)(6) of the Internal Revenue Code, the category for business leagues, chambers of commerce and industrial associations. As such, on its publicly available tax return, IRS Form 990, it is required to report salaries and benefits of officers and trustees, but not of other employes. The 1994 return reports the following for the AMA leadership:

At the top of the pay scale was the senior fulltime official, James S. Todd, Executive Vice President (since retired), with $458,211 in compensation, $64,716 in contributions to employe benefit plans, and $5000 in expenses. In 1993, the figures for Todd were $475,010, $58,258, and $5000.

For the 1994 President-elect, Lonnie R. Bistrow, of San Pablo, Calif., compensation was $273,645; benefits, $4212; expenses, $450.

As reported on the 1994 tax return, the immediate past President for the period July 1994-June 1995, Joseph T. Painter, of Houston, received compensation of $267,011, which included $45,031 in deferred compensation from 1993, when, as President, he was paid $287,718. In each of those years, benefits were $7560.

The 1994 President, Robert E. McAfee, of South Portland, Maine, received compensation of $218,660 and $10,200 in benefits. As President-elect in 1993, the comparable figures for him were $183,955 and $10,200.

With the title of Chairman, P. John Seward, of Rockford, Ill., received compensation of $173,877 in 1994; in 1993, as a Trustee, he received $128,317. No benefits were reported

Other entries on the AMA's 1994 return:

Daniel H. Johnson Jr., Metairie, La., Speaker, House of Delegates, $74,456.

Richard F. Corlin, Santa Monica, Calif., Vice Speaker, House of Delegates, $96,728, $1728, $750.

Nancy W. Dickey, Richmond, Texas, Vice Chairman, $125,000, $8112.

Thomas R. Reardon, Boring, Oregon, Secretary and Treasurer, $109,500, $10,200. In 1993, as a Trustee, Reardon received $131,205 and $10,200.

Listed as Trustees on the 1994 return were the following:

Pamela E. Formica, New Brunswick, NJ, $106,763.

William E. Jacott, University of Minnesota, $113,808, $7500.

Donald T. Lewers, Easton, Md., $89,490, $10,200.

Yank D. Coble, Jacksonville, Fla., $33,675, $10,200, $750.

Timothy Flaherty, Neenah, Wisc., $25,440, $7500.

Raymond Scalettar, Washington, DC, $51,255, $11,280; the 1993 return reports $168,802 and $11,712 for Scalettar.

Randolph D. Smoak Jr., Orangeburg, SC, $77,595, $12,337, $750.

Frank B. Walker, St. Clair Shores, Minn., $87,833, $4212.

Percy Wootton, Richmond, Va., $77,884, $11,712.

Rare among professional societies, the AMA has established a political action committee, AMPAC, which, as a separate entity, can engage in political activities barred to tax-exempt organizations. Dating back to the late 1950s, AMPAC is described in current AMA membership literature as "your voice for organized medicine in US House and Senate races. It provides the opportunity to help elect pro-medicine candidates, in an overall effort to advance the medical community's legislative agenda."

*Previous Pay Checks: Howard Hughes Medical Institute, April 15; National Academy of Sciences, May 1; American Chemical Society, May 15; American Psychological Association, June 1; American Association for the Advancement of Science, June 15; American Psychiatric Association, July 1; Association of American Medical Colleges, August 1; American Council on Education, September 15; Association of American Universities, October 1; Pharmaceutical Research and Manufacturers of America, October 15; Heritage Foundation, November 1.*

***Next: American Enterprise Institute***

# *Q&A: NSF Director*

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we must also take out some time to interact with the people around us, our neighbors, who, for whatever reason, didn't learn about science and don't know why it's important, and have trouble reading articles in the newspaper that could properly convey what science is all about and how important it is. So, it's being a citizen in a broader sense and taking advantage of our knowledge in science and trying to convey that to others around us.

***SGR.*** *Every scientist a missionary?*

***Lane.*** Well, every scientist a citizen. And those who can most effectively help their friends and neighbors and relatives understand what it's about and why it's important, I'd say should do more of that.

# Scandal at NIH, and No Dingell to Investigate

Relegated to minority status, Rep. John Dingell (D-Michigan), reviled for his strident inquiries into scientific fraud when he was a major power in Congress, won't be looking into the seamy case disclosed last month at the National Institutes of Health.

Too bad, because the little that's publicly known about the episode does not invite confidence in the explanation so far given. Unfortunately, the Republicans who control Dingell's former power base, the House Commerce Committee, have shown no interest in scientific misdeeds, nor is there any elsewhere on Capitol Hill.

The NIH case occurred in the laboratory of an eminence of biomedical research, Francis S. Collins, Director of the National Center for Human Genome Research and Chief of the Laboratory of Gene Transfer, on NIH's Bethesda, Md., campus. Collins is a prolific researcher. Since 1971, he has been the author or co-author of 212 papers in peer-reviewed journals, including 31 published in 1995. So far this year, he's got another 26 in print or in the editorial mill.

On October 29, the *Chicago Tribune* reported that nearly a month earlier, Collins had written an anguished letter to some 100 genome researchers, informing them that he had retracted parts or all of five papers produced in his laboratory. The papers, concerning leukemogenesis, were published in *PNAS*, *Genomics*, *Molecular and Cell Biology*, and *Genes, Chromosomes & Cancer*—all peer-reviewed journals of high repute. He had made the retractions, Collins wrote, after a graduate student working in the lab "confessed to a stunning series of data misrepresentations and outright fabrications, extending over a period of at least two years."

The student was confronted, and then confessed, Collins explained, after a "careful reviewer raised concerns about the specifics of some data in a manuscript which was under review for possible publication."

The letter continued: "The reviewer noted that supposedly independent lanes in a figure of this manuscript appeared to be related to each other in a way that suggested intentional deception. This observation triggered a review of the experimental efforts of the suspected individual, who is no longer in the laboratory. Careful analysis of laboratory notebooks, photographs, x-ray films, and his PhD dissertation thesis uncovered additional examples where the authenticity of data could not be verified."

Collins' letter did not identify the student, but the *New York Times* subsequently identified him by name as a "graduate student at the University of Michigan who had worked in Dr. Collins' laboratory," and who has since returned to Ann Arbor. Disclosure of the retractions was being restricted at that point to a limited number of researchers, Collins added, "because it is required by regulations on the investigation of scientific misconduct that notification of suspected data fabrication be limited to those with a 'need to know', but this certainly includes those working in this field of research." Collins later explained that he had resorted to the letter to colleagues because of the slow pace of journal publication.

Writing that "I am sure that you must share a sense of shock and outrage at these events," Collins then addressed the interesting question of how the graduate student's delinquencies went undetected for at least two years.

"Many will wonder whether I as the research mentor was paying sufficient attention to this individual if such deliberate and systematic assaults on scientific truth were occurring. Yet I had no evidence, in frequent interactions with the individual over the course of three years, to question his honesty.

"Even in retrospect," Collins continued, "I am not sure how these deceptions could have been uncovered sooner. Science cannot operate in an atmosphere where every participant is considered suspect until proven otherwise. We are all vulnerable to breaches of this sort. Fortunately, those rare instances of dishonesty, sometimes spectacular as in this circumstance, are usually uncovered by the process of science itself, which tends to weed out false conclusions."

Collins told the *Times* that he was "grateful for the care that the reviewer took looking at the figure that I must have looked at 50 times, and that other people in the laboratory had looked at at least as often, in seeing what had eluded us."

SGR has heard some privately expressed dismay with Collins's account, as well as a public statement that echoes this dismay. In a letter published in the *Times* November 7, Lowell M. Greenbaum, Vice President Emeritus for Research at the Medical College of Georgia, declared himself "not impressed" with Collins' explanation.

"It wasn't until after Collins received some inkling of the fraud that he checked samples confirming the fraud. There is an adage in the laboratory," Greenbaum wrote, "that if a result is too good, it is probably due to error, requiring reproduction of the experiments."

Greenbaum continued: "Dr. Collins should have seen that the experiments were repeated and not have waited until the data were published.... While students who commit fraud deserve no place in science, the mentor deserves chastisement for his failure to conduct checks, especially if the results will have great consequence."

The case is under investigation by the University of Michigan and the Office of Research Integrity.

# In Print

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**From the Organization for Economic Cooperation and Development (OECD):**

***Saving Biological Diversity: Economic Incentives*** (156 pp., $39), provides 34 case studies in which incentives such as creation of property rights, markets for products, government policies, etc., are described as promoting biodiversity. The report was produced by the OECD Environment Directorate, at OECD headquarters, 2, Rue Andre-Pascal, 75775 Paris.

**Order from: OECD Publications and Information Center, 2001 L St. NW, Suite 650, Washington, DC 20036-4922; tel. 202/785-6323; fax 202/785-0350; also available from bookshops and OECD offices in major cities around the world.**

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**From the National Academy of Sciences:**

***Possible Health Effects of Exposure to Residential Electric and Magnetic Fields [EMF]*** (314 pp., $45, plus $4 for shipping), mandated by Congress, and based on a literature study nearly three years in the works, concludes that "the current body of evidence does not show that exposure to these fields presents a human-health hazard." Noting a small increase in childhood leukemia in homes close to power lines, the report says other causes may possibly be involved—such as herbicides applied around transmission towers, older homes and denser traffic in the less-desirable vicinity of the lines. The evidence, it says, is inconclusive and warrants further research, as does the relationship of high exposures of EMF and breast cancer in animals previously exposed to known carcinogens. The report was produced by the Academy's Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems, chaired by Charles F. Stevens, Howard Hughes Medical Institute, Salk Institute, La Jolla, Calif. The Study Director was Larry H. Toburen, now with the Physics Department, East Carolina University, Greenville, NC.

***Mortality of Veteran Participants in the CROSSROADS Nuclear Test*** (139 pp., $29, plus $4 for shipping), by the Institute of Medicine (IOM), health-policy arm of the Academy, says the death rate among the 40,000 Navy personnel in the vicinity of nuclear tests at Bikini atoll in 1946 was 4.6 percent higher than in a control group of servicemen. But the study, which has been tracking the two groups of veterans since 1986, says radiation exposure does not appear to account for the differential in death rates. Noting lower death rates in some categories of higher exposure, the study says "an unidentified factor other than radiation" may be involved in the higher rates. The report was produced by the IOM Committee on the CROSSROADS Nuclear Test, chaired by Richard B. Stelow, Biology Department, Brookhaven National Laboratory, Upton, NY. J. Christopher Johnson of the IOM staff was Study Director.

**Order from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 1-800/624-6242 or 202/334-3313.**

**From the General Accounting Office, no charge:**

***International Environment: US Funding of Environmental Programs and Activities*** (GAO/RCED-96-234; 40 pp.), in response to a request by Senator Jesse Helms, Chairman of the Foreign Relations Committee, for a summary of US government funding of international environmental programs, the GAO reports total spending of $975 million in fiscal years 1993-95. The biggest spender, with 61 percent of the total, was the Agency for International Development, followed by the Department of Energy, 31 percent, and the Departments of State and Commerce and the Environmental Protection Agency. About 70 percent of the funds were linked to the UN's Framework Convention on Climate Change. Though just published, the GAO report was delivered to Helms in September, too late in the session for a wrecking ploy by the fulminating right-wing legislator. However, he's back. So, look for action early next year.

***Department of Energy: Unethical Conduct at DOE's Yucca Mountain Project*** (GAO/OSI-92-2; 19 pp.), reports that in violation of government regulations for ethical conduct, senior DOE employes had "long-term personal relationships" with personnel of Science Applications International Corporation and other contractors at the proposed Yucca Mountain (Nevada) nuclear waste-disposal site. Listed among the sins were unapproved meetings with members of Congress. The misdeeds, extending over a period from 1987-94, led to a series of internal investigations, but matters finally came to a head in 1993, the GAO states, when the DOE project manager and a senior contractor official "engaged in a public altercation at the Phoenix, Arizona, airport." The report was requested by Rep. George Brown (D-Calif.), senior Democrat on the House Science Committee.

**Order from: USGAO, PO Box 6015, Gaithersburg, Md. 20884-6015; tel. 202/512-6000; fax 301/258-4066; GAO on the Internet: <http://www.gao.gov>.**


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# In Print

## Official reports and other publications of special interest to the research community

*(Copies of publications listed here are available from the indicated sources—not from SGR)*

**From the National Science Foundation, no charge:**

***Scientific and Engineering Research Facilities at Colleges and Universities: 1996*** (NSF 96-326; about 240 pp.), sixth in a biennial series of statistics on the construction, renovation, quality, etc., of laboratory facilities in the major disciplines in a large sample of public and private research institutions. The overall findings include a decline in new construction (in 1995 dollars), from $3.4 billion worth of projects started in 1990-91 to $2.8 billion in 1994-95. During that time, expenditures for repairs and renovations went up, but so did deferrals of maintenance for financial reasons. Direct federal funding for construction declined from $541 million in 1990-91 to $207 million in 1994-95. State governments provided most of the wherewithal for new construction at public universities, while institutional funds, including overhead on federal grants, were the main source of finance at the private universities.

***Federal Scientists and Engineers: 1989-93*** (NSF 95-336; 171 pp.), covering a period just before the Clinton Administration began reducing government job rolls, reports that employment of engineers by federal agencies stood steady at about 96,000 while the number of scientists rose from 89,530 to 101,348. Physical scientists registered the smallest increase, from 23,204 to 24,118, while employment of computer and mathematical scientists increased from 25,737 to 29,691. Jobs in the social sciences increased from 17,507 to 20,619. As a proportion of the nation's science and engineering workforce, federal employment declined, from 7.3 percent in 1989 to 7 percent in 1993. But S&E employment was the big gainer among all federal white collar jobs, rising 6.1 percent while other job categories went up 1.2 percent. This multi-year report, embodying data from an annual series, was itself delayed, for about a year, by stretched staffing at NSF.

***Teacher Preparation and NSF Collaboratives for Excellence in Teacher Preparation: FY 96 Awards*** (NSF 96-146; 54 pp.), briefly describes dozens of NSF-supported projects for improving the education of prospective elementary and secondary teachers of mathematics technology and science. The program annually adds three to five "Collaboratives"—multi-institutional, regional or statewide programs, funded at up to $1 million a year for five years. From fiscal 1993 to 1995, 10 of these were established, with the participation of over 100 educational institutions and other organizations. Three Collaboratives were added in 1996, headquartered at San Jose State University, California; Virginia Commonwealth University, and the University of Tulsa, Oklahoma. Contacts are given for each of the projects described in the report.

***Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering, and Technology*** (NSF 96-139; 76 pp.), from the advisory committee to NSF's Directorate for Education and Human Resources, recommendations for greatly broadened undergraduate programs and a doubling of NSF expenditures in this area over the next decade. The report, under review at NSF since last spring, was produced by a subcommittee chaired by Melvin D. George, President Emeritus, St. Olaf College, Minnesota, and is intended as a successor to the influential 1986 report produced under the chairmanship of Homer A. Neal, *Undergraduate Science, Mathematics, and Engineering Education* (NSF 86-100). The new report says the US excels in producing scientific superstars "while most of its population is virtually illiterate in science."

**Order from: National Science Foundation, Forms and Publications Office, Room P-15, Arlington, Va. 22230; tel. 703/306-1130; fax 703/644-4278; e-mail: <pubs@nsf.gov>; Internet: <http://www.nsf.gov>.**

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**From the Office of Research Integrity (ORI):**

***Annual Report: 1995*** (42 pp., no charge), says ORI, often criticized for procedural torpor in dealing with scientific misconduct, moved more briskly in 1995, closing 58 cases, compared with 42 in the prior year. A brief reference to ORI's humiliating loss in the Imanishi-Kari case (commonly referred to as the Baltimore case) correctly states that an appeals panel's reversal of ORI's findings of misconduct was "primarily based on [the panel's] rejection of extensive forensic evidence provided by the U.S. Secret Service." ORI does not mention the judicial lashing it received from the panel, which stated in its decision that "much of what ORI presented was irrelevant, had limited probative value, was internally inconsistent, lacked reliability or foundation, was not credible or corroborated, or was based on unwarranted assumptions."

**Order from: Office of Research Integrity, 5515 Security Lane, Suite 700, Rockville, Md. 20852; tel. 301/443-5300; fax 301/443-5351.**

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**From the University Science Center (Philadelphia):**

***Energy Efficiency in Action: A 10-year History of Manufacturers' Implementation and Rejection of Energy-conserving and Cost-saving Opportunities*** (70 pp., $25), reports on the response to technical advice provided to 3612 small firms throughout most of the US under a program sponsored by the US Department of Energy. Covering firms with no more than 500 employes and gross annual sales under $75 million, the study concluded that "acceptable financial risk, including short payback time, is an essential component in a decision to implement cost savings based on energy conservation." F. William Kirsch, Vice President of the Center's Industrial Technology and Energy Management Division, is lead author on the report.

**Order from: University City Science Center, Industrial Technology and Energy Management Division, 3624 Market St., Philadelphia, Pa. 19104; tel. 215/387-2255; fax 215/387-5540.**

*(Continued on Page 7)*